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## (54) Gaming or amusement machine

(57) A gaming or amusement machine has a spinning reel device 4 and video screen 2 on which a video game may be displayed. Operation of the machine to play the video game may take place only following a winning event displayed on the reels.

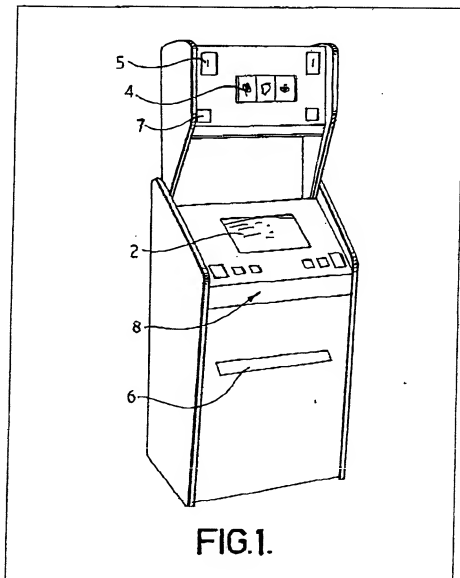
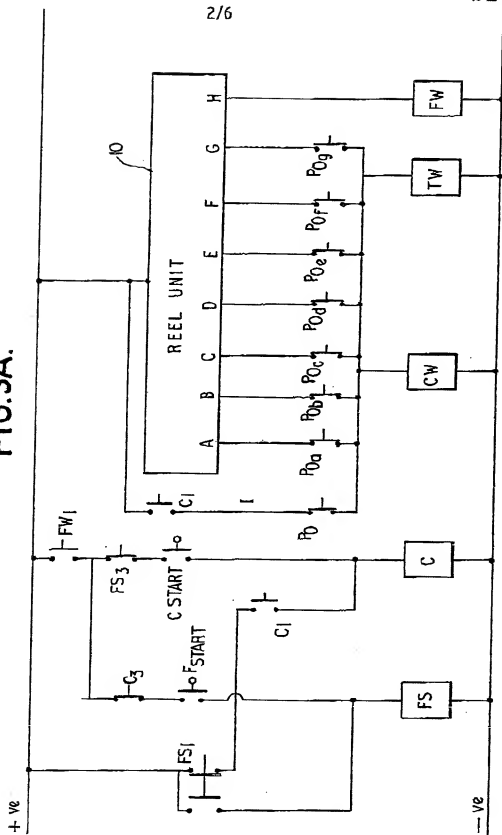


FIG. 3A.



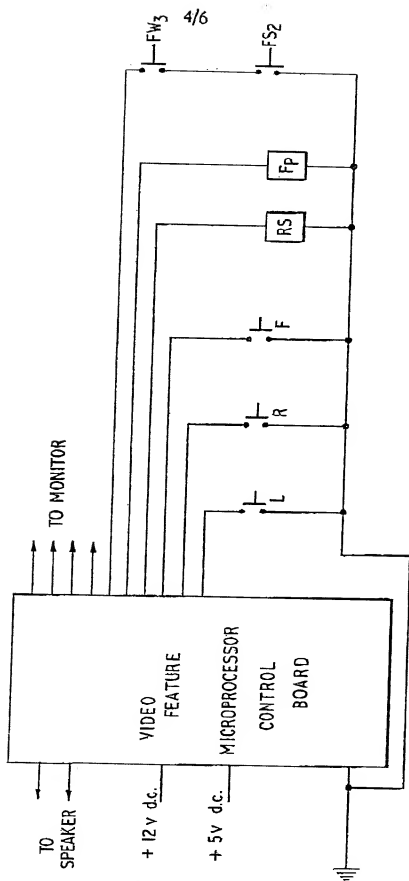


FIG. 3C.

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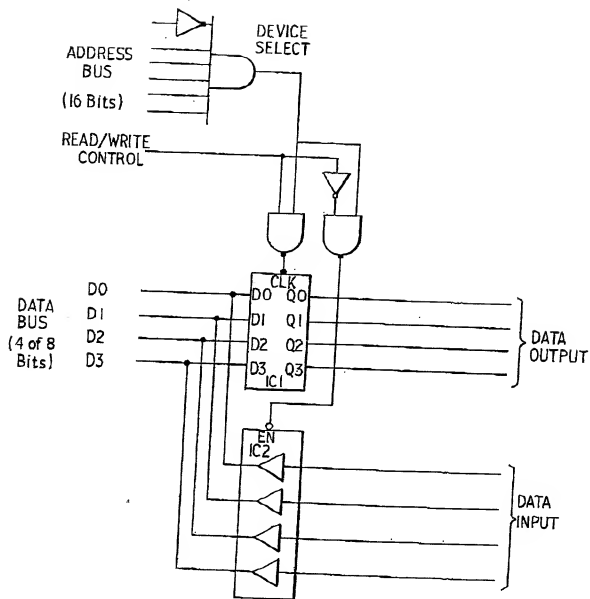


FIG.5.

winnings on the reels.

It is possible to construct and arrange a machine in a number of different ways in order to achieve the operations and effect described above. Two examples will now be described with reference to the drawings, wherein:

Figure 1 shows the external features of a machine in accordance with the present proposal in a perspective view.

Figure 2 is a diagram to show the sequence of operations performed by the machine.

Figures 3a, 3b and 3c show parts of the circuitry of an electro-mechanical spinning reel type gaming machine, incorporating a video display unit, in order to indicate the inter-relationship between the reel unit and video display unit.

Figure 4 is a block diagram of a microprocessor controlled spinning reel gaming machine, incorporating a video display unit, and

Figure 5 shows an interface unit for the embodiment shown in Figure 4.

Referring to Figure 1, the gaming machine shown therein comprises a casing 1 apertured to reveal the screen 2 of the cathode ray tube of a video display unit and the peripheral surfaces of three reels 4 of a reel unit. The peripheral surfaces of the reels are marked with various symbols, in particular items of fruit, and the aperture through which the reels are visible is marked with a "win line". The casing has slots 5 for the insertion of coins and a tray 6 for the reception of coins and tokens delivered by the machine as prizes. Manual controls 7 are provided for operating the reels and manual controls 8 for the control of a microprocessor control unit of the video display unit. The casing also houses a loudspeaker to which signals are supplied by the microprocessor.

Within the casing, but not illustrated, the reels are mounted on a drive shaft, each reel being coupled to the shaft by way of a slip clutch to permit the reels to be halted individually while the shaft continues to rotate. The shaft is drivable by means of an electric motor, and each reel is associated with an index solenoid which, when energised, permits the reel to rotate. Provided that microswitches associated with the coin and token slots 5 have responded to the insertion of coins or tokens of sufficient value and activated the machine accordingly for an operation, energisation of the motor circuit may be effected by closing a start push-button switch.

Closing this switch also energises the motor of a control cam timer which performs one complete rotation for each operation of the machine and performs overall sequence timing. This arrangement is conventional. Also conventional, and likewise not illustrated, the machine includes a cam timer, which determines by the position in which it comes to rest, whether a "hold" is available for the next operation, in other words, whether the player may hold any of the reels stationary. Provided that this timer indicates the availability of a "hold", hold relays may be energised and latched by closing push-button switches associated with the reels. Each hold relay which is energised opens a normally closed contact in the circuit of an index solenoid to prevent its energisation and spinning of the associated reel.

Fast with each reel is a disc formed with a slot for reception of a bar for holding the reel in a fixed position. As the control cam enters three successive predetermined positions, the bars of the three reels are moved into their locking position, the reels being halted in sequence in this manner until when the third and last reel is halted, the motor driving the reels is de-energised. The reel unit is represented by the box 10 shown in Figure 3 and, in the event that the reels halt with a winning combination of symbols in alignment on the win line, the interengagement of selected studs and wipers on the reels results in the appearance of a signal on a number of outputs (A to H) from the reel unit, depending upon the prize awarded. Thus a signal of line A indicates a prize in cash of 20p, on lines B, C and D of cash prizes of 30p, 40p and 50p, respectively and on line E of a cash prize of £1. Signals on lines F and G indicate prizes of tokens valued at £1.50 and £2 respectively. A signal on line H, however, indicates a feature win, namely that the player has won the entitlement to play the video game, or to collect instead a cash prize of, say 20p in lieu.

The dispensing of the cash and token prizes for normal wins is controlled by a payout timer indicated within the box 11 in Figure 3b. This timer comprises a motor M for driving a cam, or set of cams, which cam tracks, indicated at CA, CB and CC for operating certain microswitches.

Returning to Figure 3a, the output lines A to E from the reel unit 10, are connected to a cash win relay CW, the lines F and G to a token win relay TW, and the line H to a feature win relay FW. The cash win relay CW may also be energised by a signal on a further line I which bypasses the reel unit, for a purpose which will shortly become clear. The lines A to G and I include the contacts of payout timer microswitches POa to POf and POI.

The cam track CA of payout timer 11 is associated with a contact CA1 which is closed when the cam begins to rotate and closes a circuit through the payout timer motor M until the cam has rotated through one revolution, when the contact CA1 re-opens to terminate the supply to the motor. The cam track CC has a series of evenly distributed notches, the number of which is equal to the maximum cash prize in coins of a suitable value, for example, 10p pieces. During rotation of the cam a contact CC1, associated with the track CC repeatedly closes and re-opens in the circuit of cash and token payout relays CPR and TPR. The circuits of these relays also include normally open contacts CW1 and TW1, respectively, of the cash and token win relays CW and TW shown in Figure 3. The microswitches POa and POi are all closed when the cam timer is in its start position. The cam track CB is so arranged that the contacts POa to POe open successively one after the other at predetermined moments of time, and likewise the contacts POf and POG in accordance with a separate sequence. The contact POI is arranged to open at the same time as one of the contacts POa to POe, depending upon the value of the prize to be given in lieu of the entitlement to play a video game.

Each of the relays CW and TW has a normally

logic from an input/output (I/O) circuitry.

Most microprocessor controllers have spare input and output capabilities and this may be used for communication with the display logic as indicated, if, however, no spare capacity exists it is necessary to extend the input/output as follows.

An unused device address is selected and used to control an interface with latched output, these being offered to the data input through a similar unit on the display logic. A circuit diagram of the unit including a quad latch IC1 and three state buffer IC2 is shown in Figure 5. The data received back is strobed onto the data bus when the read/write control line is low and the correct device address is present on the address bus. Therefore, data is input and output in a similar manner to storing and retrieving data from a memory location.

In use, the microprocessor controls the game functions according to the data stored in its permanent memory, performing electronically the tasks described above in relation to electro-mechanical controllers. However, when a feature win is detected and the player elects to play the video game, a signal is output to the video logic, this being in the form of setting one of, for example, four data bits. The display which will be in its attract mode will frequently sample these data lines and when the appropriate bit is set, will commence the video game. At the conclusion of the game, information as to the amount to be paid out will be written on the video's quad output latch. This will be detected by the gaming controls, whilst the video game was being played, would continually sample its input interface to await the arrival of payout information. The appropriate prize is then output and when complete the gaming control writes zeros into its four bit latch as an acknowledgement that the payment is complete and will revert to its normal function. The video logic should not detect the absence of the initializing and write zeros into its output register, after which it reverts to the attract mode, the sequence being complete.

A single microprocessor control unit may be used to combine both the spinning reel and video logic into one unit as only one function is required at a time.

Although as described herein the reels rotate about a common axis in conventional fruit machine manner, and have the symbols of the peripheral surfaces of the reels, it will be appreciated that it is possible for the reels to be replaced by discs, for example, which rotate about respective parallel axes. Reference is hereby directed to British Patent Application No. 8105918 from which this present application is divided.

#### CLAIMS

1. A gaming or amusement machine including a plurality of rotatable reels bearing indicia, a drive mechanism for setting the reels in motion, actuation of the drive mechanism being caused or permitted by a coin or token-free device, a mechanism for releasing to the player at least one coin or token following halting of the reels in a predetermined

winning relationship, a video display screen, and an electronic unit for generating a signal which is displayed as an image on the screen indicative of information concerning the game to be played on the machine, the electronic unit being reprogrammable to vary the display.

2. A gaming or amusement machine including a plurality of rotatable reels bearing indicia, a drive mechanism for setting the reels in motion, a video means including electronic means for generating a signal, and a video display screen on which the signal is displayed as an image, the electronic means being adapted to permit a video game to be played wherein the operation of the video means to play a video game is permitted to take place only following halting of the reels in a predetermined winning relationship.

3. A gaming or amusement machine including a plurality of rotatable reels bearing indicia, a drive mechanism for setting the reels in motion, actuation of the drive mechanism being caused or permitted by a coin or token-free device, a video game unit including electronic means for generating a signal and a video display screen on which the signal is displayed as an image, the electronic means being controllable either by the player or operating at least partially at random, and a mechanism for releasing to the player at least one coin or token following the display on the screen of a predetermined image; wherein initiation of the operation of the video game unit or of the coin or token release mechanism is permitted to take place only following halting of the reels in a predetermined winning relationship.

4. A machine as claimed in claim 3, including means operable following halting of the reels in a predetermined winning relationship to selectively initiate operation of the video game unit or of the coin or token release mechanism.

5. A machine as claimed in claim 4, including means for displaying the amount of the players winnings following halting of the reels in a predetermined winning relationship, means for permitting the player to stake all or part of this amount on the outcome of a game played on the video game unit, the display of said amount being reduced by the amount of the stake.

6. A gaming or amusement machine including a plurality of rotatable reels which bear indicia on their peripheral surfaces, a drive mechanism for setting the reels in motion, actuation of the drive mechanism being caused or permitted by a coin or token-free device, a mechanism for releasing to the player at least one coin or token following halting of the reels in a predetermined winning relationship, an electronic unit for generating a signal and a video display screen on which the signal is displayed as an image indicative of the winning combination of indicia on the reels, the electronic unit being reprogrammable to vary the display.